

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i07511232

Cylinder Head - Install

SMCS - 1100-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	439-3938	Link Bracket	2

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the spacer plate and the surface of the cylinder block are clean.

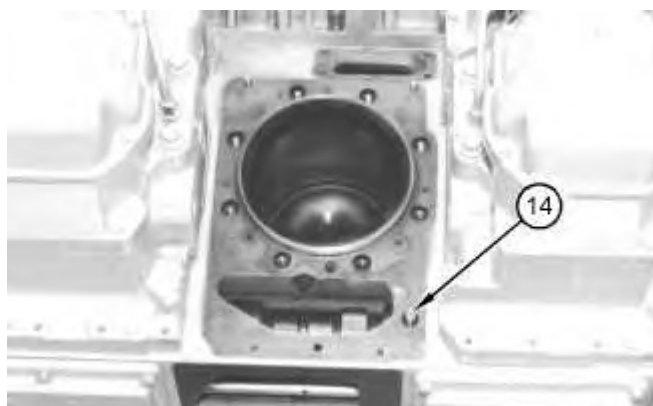


Illustration 1

g01053983

2. Install the O-ring seal on dowel (14).



Illustration 2

g01053978

NOTICE

Ensure that the surface of the spacer plate gasket and the surface of the cylinder block are clean. Do not use a gasket adhesive on these surfaces.

3. Install a new gasket (13) on the dowels in the cylinder block.

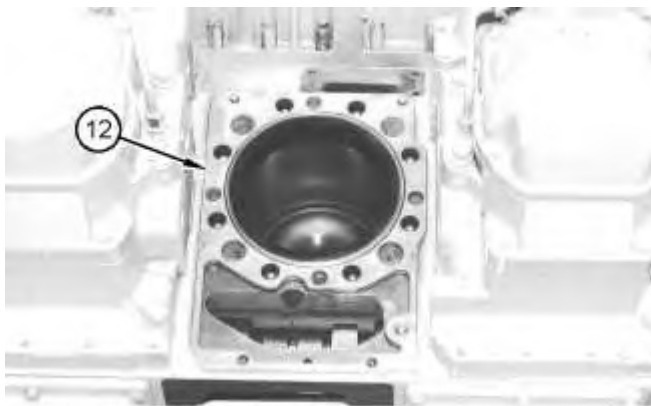


Illustration 3

g01053977

4. Install spacer plate (12) on the dowels.
 5. Check the cylinder liner projection. Refer to Testing and Adjusting, "Cylinder Liner Projection" for the correct procedure.
-

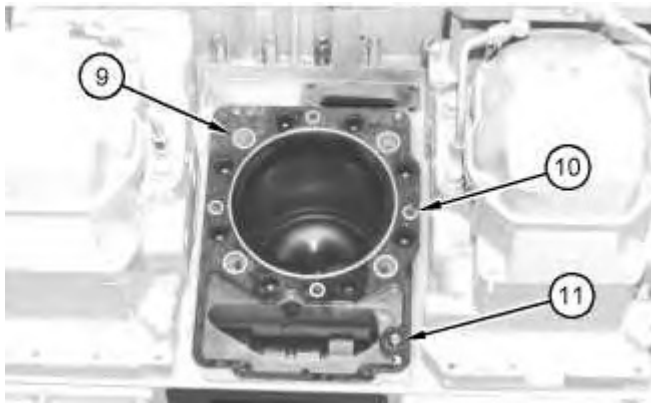


Illustration 4

g01053975

6. Install new seals (9) and (10) in the spacer plate.
7. Install a new O-ring seal (11) on the dowel.
8. Ensure that the bottom of the cylinder head assembly is thoroughly clean.

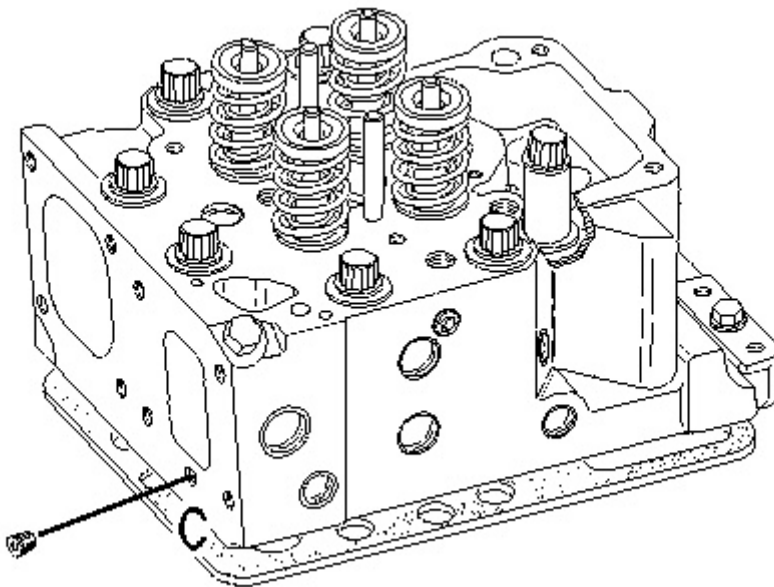


Illustration 5

g00618255

NOTICE

The plug for Location (C) MUST be installed in the cylinder head.

9. Install Tooling (A) into the threaded holes for the valve cover base in the cylinder head. Attach a suitable lifting device to Tooling (A).

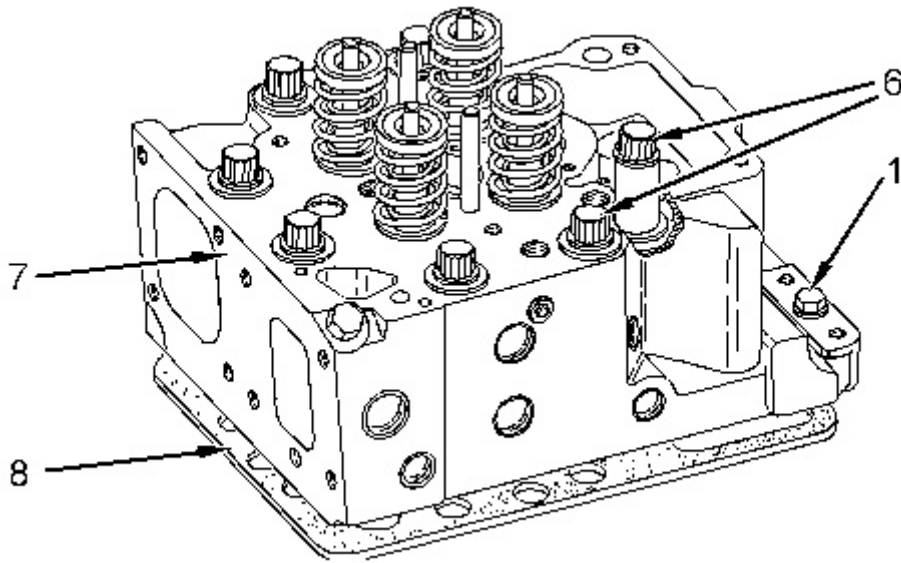


Illustration 6

g01053935

Note: The weight of cylinder head assembly (7) is approximately 47 kg (104 lb).

10. Install a new head gasket (8). Lift cylinder head assembly (7) into position on the cylinder block. Install bolts (6) and (1) according to the instructions in Step 11, Step 12, or Step 13.

Note: Only 216 mm (8.5 inch) bolts (6) can be used for the following torque procedures.

Note: Refer to Specifications, "Cylinder Head".

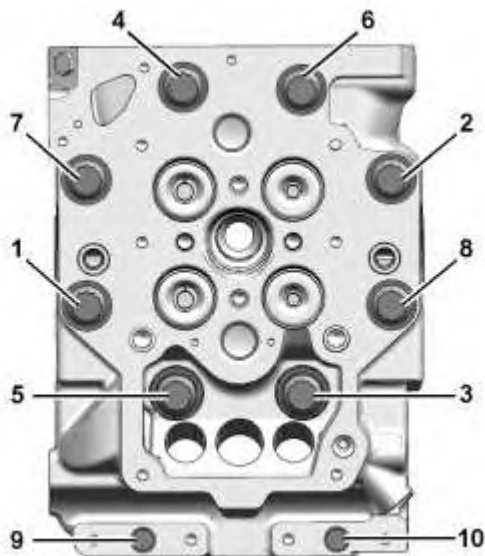


Illustration 7

g06344184

11. **Tightening sequence with 362-8264 Cylinder Head Gasket (MLS) and 519-7297 Spacer Plate (Iron).**

Note: Refer to Illustration 7 for the correct tightening sequence.

- a. Coat the threads of the bolts with clean engine oil.
 - b. Tighten bolt (1) through bolt (8) to a torque of 30 ± 5 N·m (22 ± 4 lb ft).
 - c. Tighten bolt (1) through bolt (8) to a torque of 145 ± 15 N·m (107 ± 11 lb ft).
 - d. Tighten bolt (1) through bolt (8) to a torque of 145 ± 15 N·m (107 ± 11 lb ft).
 - e. Turn bolt (1) through bolt (8) an angle of 180 ± 5 degrees.
 - f. Tighten bolts (9) and (10) to a torque of 55 ± 10 N·m (40 ± 7 lb ft).
-

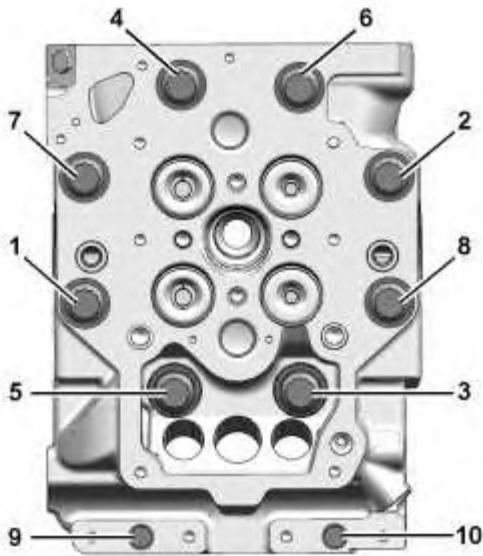


Illustration 8

g06344184

12. Tightening sequence with 362-8264 Cylinder Head Gasket (MLS) and 110-6994 Spacer Plate (Aluminum) or 362-9677 Spacer Plate (Aluminum).

Note: Refer to Illustration 8 for the correct tightening sequence.

- a. Coat the threads of the bolts with clean engine oil.
 - b. Tighten bolt (1) through bolt (8) to a torque of 30 ± 5 N·m (22 ± 4 lb ft).
 - c. Tighten bolt (1) through bolt (8) to a torque of 100 ± 15 N·m (75 ± 11 lb ft).
 - d. Tighten bolt (1) through bolt (8) to a torque of 450 ± 15 N·m (332 ± 11 lb ft).
 - e. Loosen bolt (1) through bolt (8) an angle of 90 degrees.
 - f. Tighten bolt (1) through bolt (8) to a torque of 490 ± 15 N·m (361 ± 11 lb ft).
 - g. Tighten bolt (9) and bolt (10) to a torque of 55 ± 10 N·m (40 ± 7 lb ft).
-

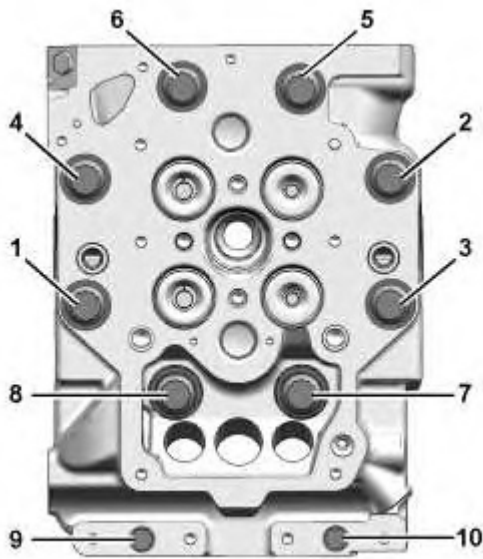


Illustration 9

g06344229

13. **Tightening sequence with 110-6991 Cylinder Head Gasket (Cellulose) and 110-6994 Spacer Plate (Aluminum) or 362-9677 Spacer Plate (Aluminum).**

Note: The cellulose head gasket cannot be used with an iron spacer plate.

Note: Refer to Illustration 9 for the correct tightening sequence.

- a. Tighten bolt (1) through bolt (8) to a torque of 30 ± 5 N·m (22 ± 4 lb ft).
- b. Tighten bolt (1) through bolt (8) to a torque of 200 ± 15 N·m (148 ± 11 lb ft).
- c. Tighten bolt (1) through bolt (8) again to a torque of 200 ± 15 N·m (148 ± 11 lb ft).
- d. Turn bolt (1) through bolt (8) to an angle of 180 degrees.
- e. Tighten bolt (9) and bolt (10) to a torque of 55 ± 10 N·m (41 ± 7 lb ft).

14. Remove Tooling (A) from the cylinder head.

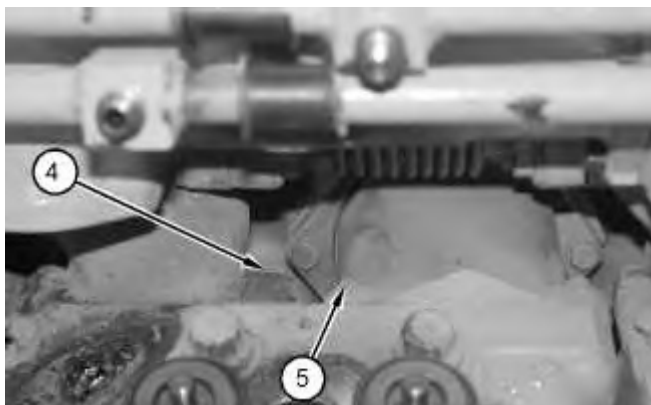


Illustration 10

g01053859

15. Install four bolts (4) (not shown) on exhaust tube assembly and install four bolts (5) (not shown) on inlet tube assembly.

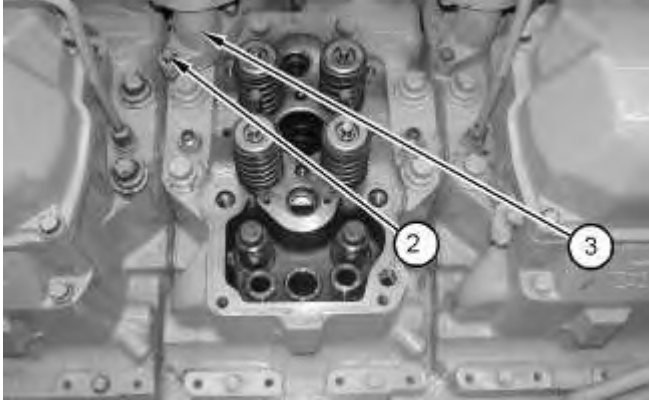


Illustration 11

g01053958

16. Position tube (3). Install bolts (2).
17. Fill the cooling system. Refer to Operation and Maintenance Manual, "Cooling System Coolant - Change".

End By:

- a. Install the valve cover base.
-

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02486600

Inlet and Exhaust Valve Springs - Remove and Install

SMCS - 1108-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	241-0124	Valve Spring Compressor	1
B	4C-9496	Spring Tester	1

Start By:

- Remove the rocker shaft and pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Place the piston at the top of the compression stroke (TC). Remove the valve springs for that cylinder. If the valves fall into the cylinder liner, then the cylinder head must be removed.

- Position the No. 1 piston at the top center of the compression stroke. Refer to Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
-

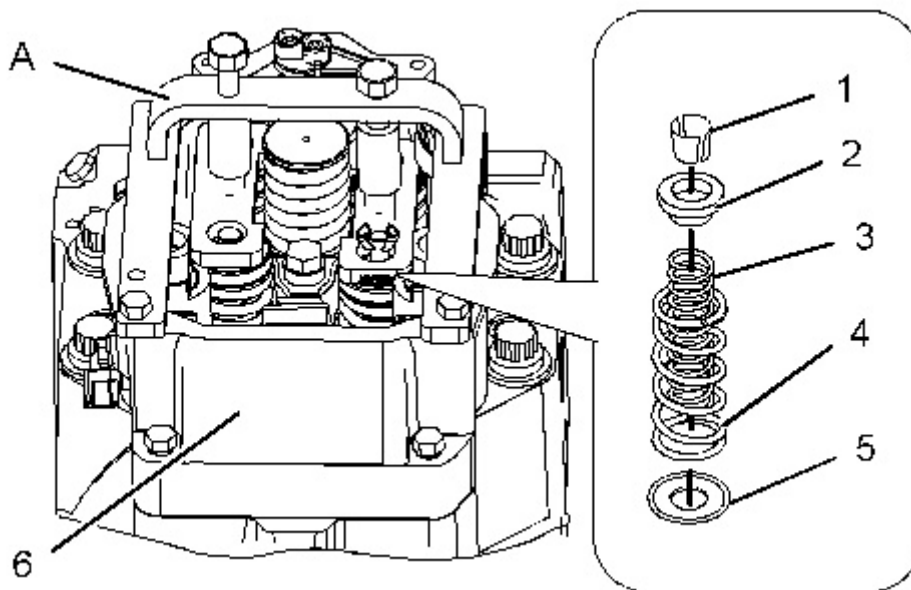


Illustration 1

g01133502

WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

2. Install Tooling (A) on valve mechanism cover base (6).
3. Use Tooling (A) to compress inner valve spring (3) and outer valve spring (4). Remove valve spring keepers (1) from the valve.
4. Carefully remove Tooling (A).
5. Remove valve rotator (2), inner valve spring (3), and outer valve spring (4).
6. Remove washer (5) from the exhaust valve guide.

Note: Washers are not installed on the inlet valve guide.

7. Use Tooling (B) to check the valve springs (spring force). Refer to Specifications, "Cylinder Head Valves" for additional information on the valve springs.

Installation Procedure

Table 2

Required Tools

Tool	Part Number	Part Description	Qty
A	241-0124	Valve Spring Compressor	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Lubricate the valve stems with clean engine oil.

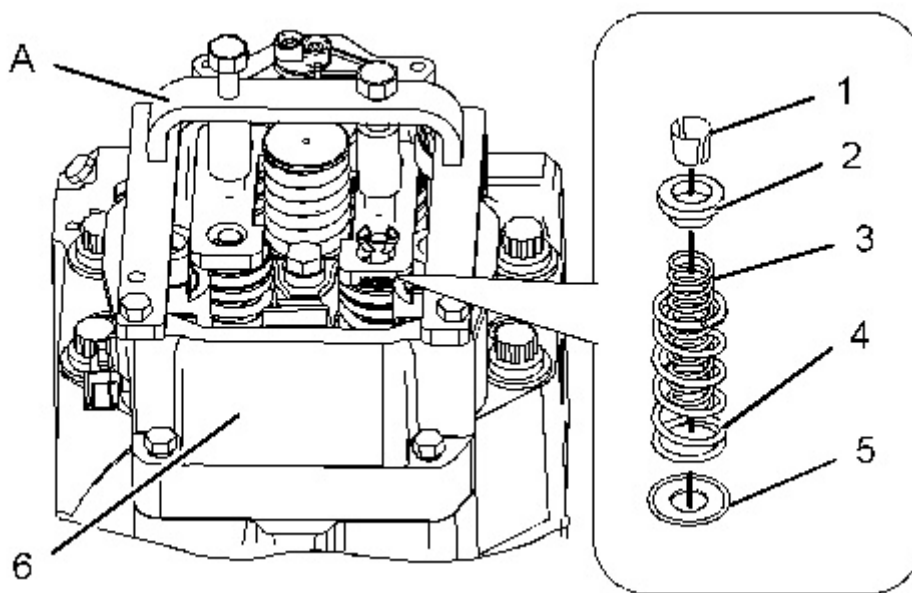


Illustration 2

g01133502

WARNING

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

2. Position washer (5), inner valve spring (3), and outer valve spring (4) on the exhaust valve guide.

3. Position inner valve spring (3) and outer valve spring (4) on the inlet valve guide.

Note: Washer (5) is not installed on the inlet valve guides.

4. Position valve rotator (2) on the valve stem.

5. Install Tooling (A) on valve mechanism cover base (6).

6. Use Tooling (A) to compress inner valve spring (3) and outer valve spring (4). Install valve spring keepers (1) on the valve. Ensure that the valve spring keepers are properly installed.



The valve spring keepers can be thrown from the valve when the valve spring compressor is released. Ensure that the valve spring keepers are properly installed on the valve stem. To help prevent personal injury, keep away from the front of the valve spring keepers and valve springs during the installation of the valves.

7. Carefully remove Tooling (A).

End By:

a. Install the rocker shaft and pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Install".

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02492601

Inlet and Exhaust Valves - Remove and Install

SMCS - 1105-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	5S-1330	Valve Spring Compressor	1
B	4C-9496	Spring Tester	1

Start By:

- Remove the cylinder head. Refer to Disassembly and Assembly, "Cylinder Head - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

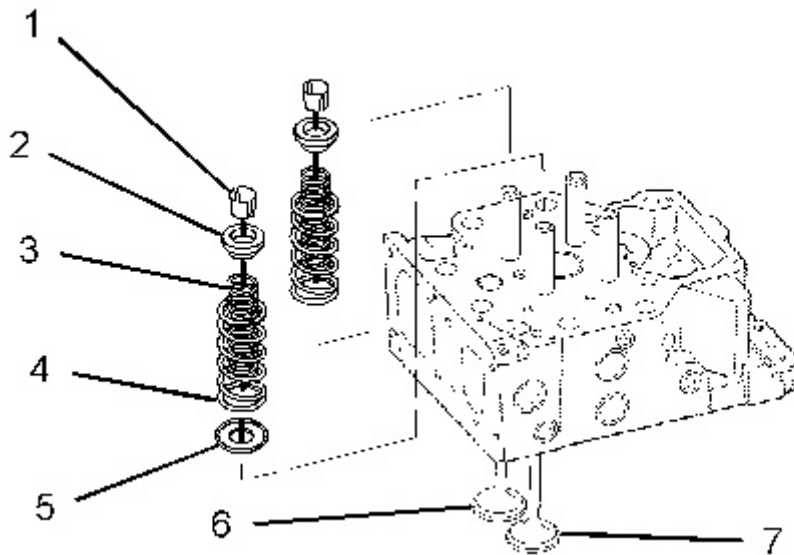


Illustration 1

g01134319

⚠ WARNING

Personal injury can result from being struck by parts propelled by a released spring force.

Make sure to wear all necessary protective equipment.

Follow the recommended procedure and use all recommended tooling to release the spring force.

1. Use Tooling (A) to compress inner valve spring (3) and outer valve spring (4). Remove valve spring keepers (1).
2. Carefully remove Tooling (A).
3. Remove valve rotator (2), inner valve spring (3) and outer valve spring (4).
4. Remove washer (5) from the exhaust valve guide.
5. Remove inlet valve (6) and exhaust valve (7) from the valve guides.

Note: If the exhaust valves or the inlet valves will be reused, put identification marks on the exhaust valves and the inlet valves for installation purposes.

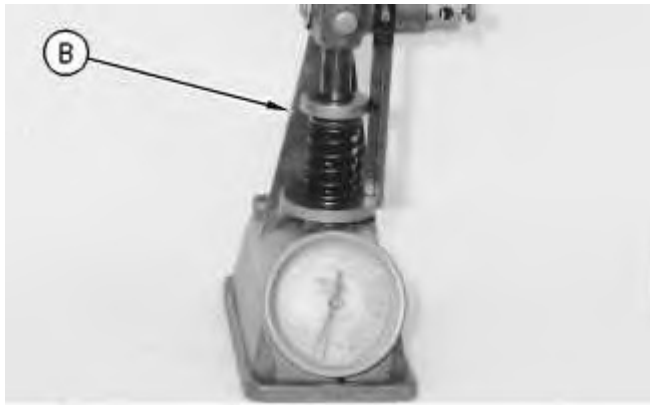


Illustration 2

g01133465

6. Use Tooling (B) to check the valve springs (spring force). Refer to Specifications, "Cylinder Head Valves" for additional information on the valve springs.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	5S-1330	Valve Spring Compressor	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

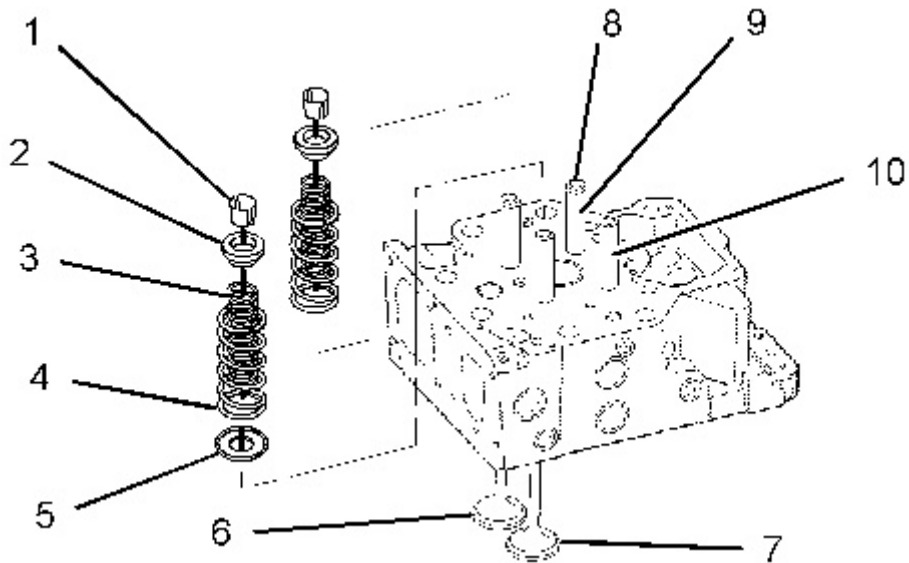


Illustration 3

g01134256

WARNING

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

1. Apply clean engine oil to the stem of exhaust valves (7). Install the exhaust valve into exhaust valve guide (10).
2. Install washer (5), inner valve spring (3), and outer valve spring (4) on exhaust valve guide (10).
3. Position valve rotator (2) on the stem of the exhaust valve.
4. Use Tooling (A) to compress inner valve spring (3) and outer valve spring (4). Install valve spring keepers (1) on the exhaust valve.

WARNING

The valve spring keepers can be thrown from the valve when the valve spring compressor is released. Ensure that the valve spring keepers are properly installed on the valve stem. To help prevent personal injury, keep away from the front of the valve spring keepers and valve springs during the installation of the valves.

5. Carefully remove Tooling (A). Strike the top of the valves with a soft faced hammer in order to ensure that valve spring keepers (1) are properly installed on the valve stems.
6. Apply clean engine oil to the stem of inlet valves (6). Install the inlet valve into inlet valve guide.

Note: Ensure that valve stem seal (8) is installed on inlet valve guide (9).

7. Install inner valve spring (3) and outer valve spring (4) on inlet valve guide (9).
8. Position valve rotator (2) on the stem of the inlet valve.
9. Use Tooling (A) to compress inner valve spring (3) and outer valve spring (4). Install valve spring keepers (1) on the inlet valve.



The valve spring keepers can be thrown from the valve when the valve spring compressor is released. Ensure that the valve spring keepers are properly installed on the valve stem. To help prevent personal injury, keep away from the front of the valve spring keepers and valve springs during the installation of the valves.

10. Carefully remove Tooling (A). Strike the top of the valves with a soft faced hammer in order to ensure that valve spring keepers (1) are properly installed on the valve stems.

End By:

- a. Install the cylinder head. Refer to Disassembly and Assembly, "Cylinder Head - Install".
-

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02492614

Inlet and Exhaust Valve Guides - Remove and Install

SMCS - 1104-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	7M-3975	Valve Guide Driver	1

Start By:

- Remove the inlet valves and the exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

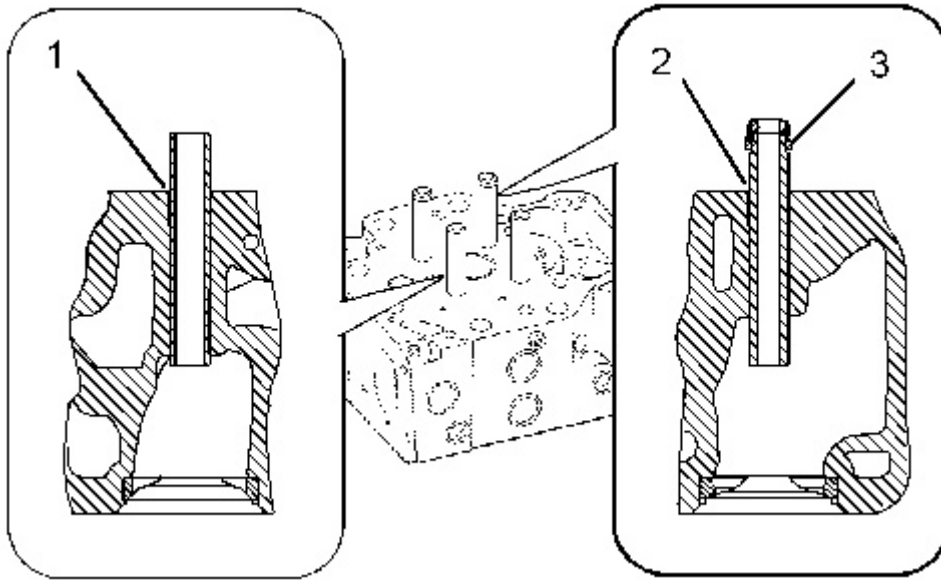


Illustration 1

g01133624

1. Remove valve stem seal (3) from inlet valve guide (2).

Note: The valve stem seal is not installed on exhaust valve guide (1).

2. Turn the cylinder head upside-down. Use Tooling (A) and a hammer to remove the valve guides from the cylinder head.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	7M-3975	Valve Guide Driver	1
B	5P-1729	Valve Guide Bushing	1

Note: If you replace the valve guides, you must replace the valve seats with new valve seats.

Note: Inspect the valve guides. Do not use valve guides with obvious damage or with excessive wear. Check available specifications. Remove valve guides that are loose or damaged. Replace the valve guides with new components, if necessary. Correct any condition that could cause the original damage or wear.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Use new valve guides for assembly.

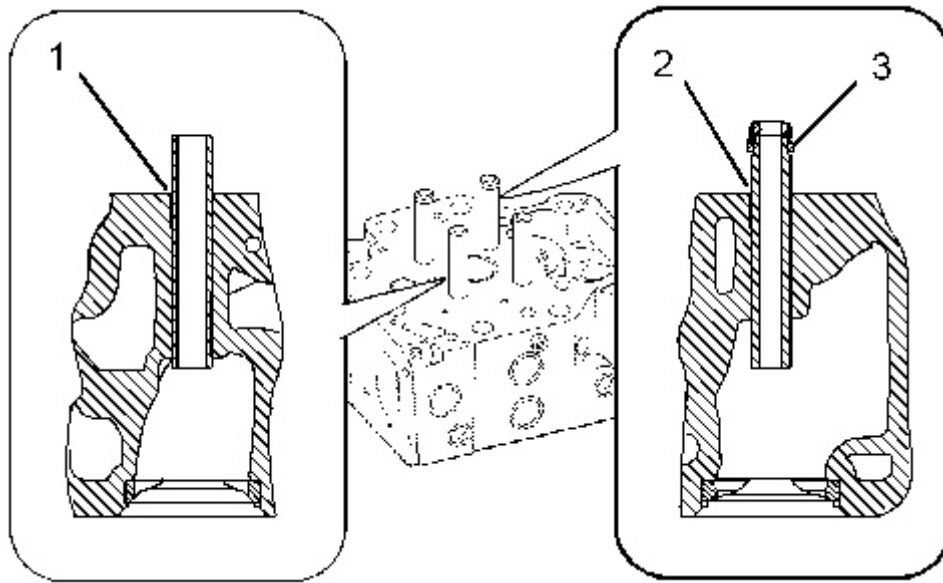


Illustration 2

g01133624

1. Coat the outside of the valve guide with clean engine oil prior to installation.
2. Use Tooling (A) and Tooling (B) to install exhaust valve guide (1) and inlet valve guide (2) in the cylinder head.
3. Install new valve stem seal (3) on inlet valve guide (2).

Note: Valve stem seals are not installed on exhaust valve guide (1).

End By:

- a. Install the inlet valves and the exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
-

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02707237

Inlet and Exhaust Valve Seat Inserts - Remove and Install

SMCS - 1103-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	166-7441	Valve Seat Extractor Tool	1

Start By:

- a. Remove the inlet valves and the exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".

Note: For information on the reusability of valve seats, refer to Guideline For Reusable Parts And Salvage Operation, SEBF8155.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

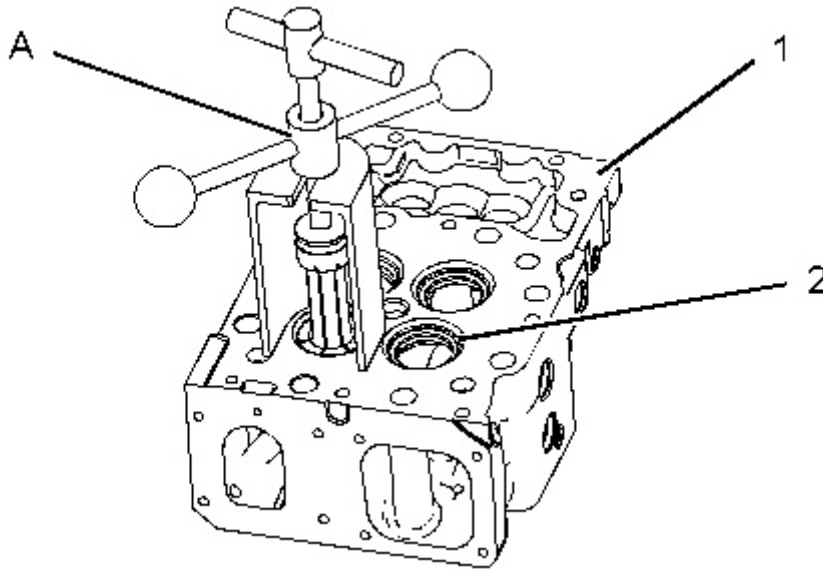


Illustration 1

g01133493

1. Use Tooling (A) to remove valve seat inserts (2) from cylinder head (1).
2. Thoroughly clean the valve seat bores in the cylinder head.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
B	1P-0510	Driver Gp	1

Note: Do not machine the prefinished valve seat inserts in order to correct the valve stem projection. An excessive valve stem projection indicates that the valve seat insert is not seated or material was not cleaned from the bottom of the counterbore.

Note: If the valve seats are replaced, you must replace the valve guides.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

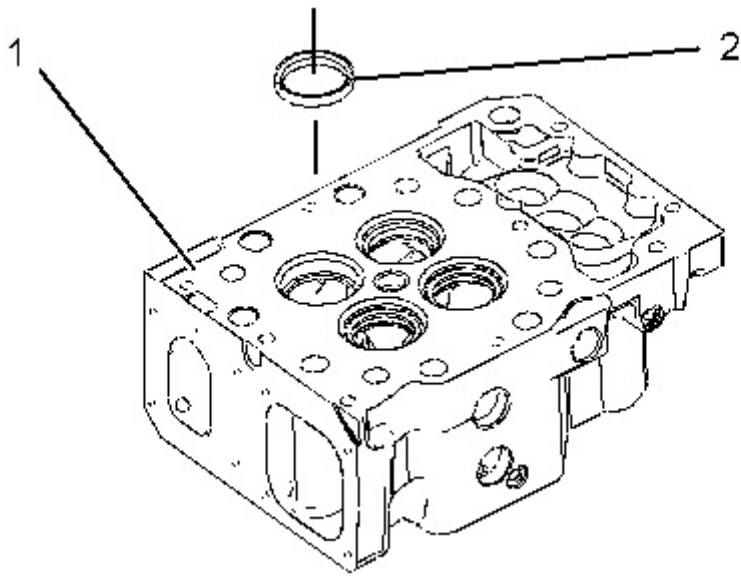


Illustration 2

g01133494

1. Lower the temperature of valve seat inserts (2).
2. Use Tooling (B) to install valve seat inserts (2) in cylinder head (1).

End By:

- a. Install the inlet valves and the exhaust valves. Refer to Disassembly and Assembly, "Inlet and Exhaust Valves - Remove and Install".
-

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE RL5
Configuration: 3512C Locomotive Engine RL500001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02486937

Accessory Drive (Front) - Remove - Engine Oil Pump and Water Pump

SMCS - 1207-011

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Forcing Screw 3/8 - 16 by 1 1/2 inch	2
B	-	Forcing Screw 1/2 - 13 by 1 1/2 inch	2

Start By:

- Remove the auxiliary water pump. Refer to Disassembly and Assembly, "Auxiliary Water Pump - Remove".
- Remove the engine oil pump. Refer to Disassembly and Assembly, "Engine Oil Pump - Remove".
- Remove the water pump. Refer to Disassembly and Assembly, "Water Pump - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

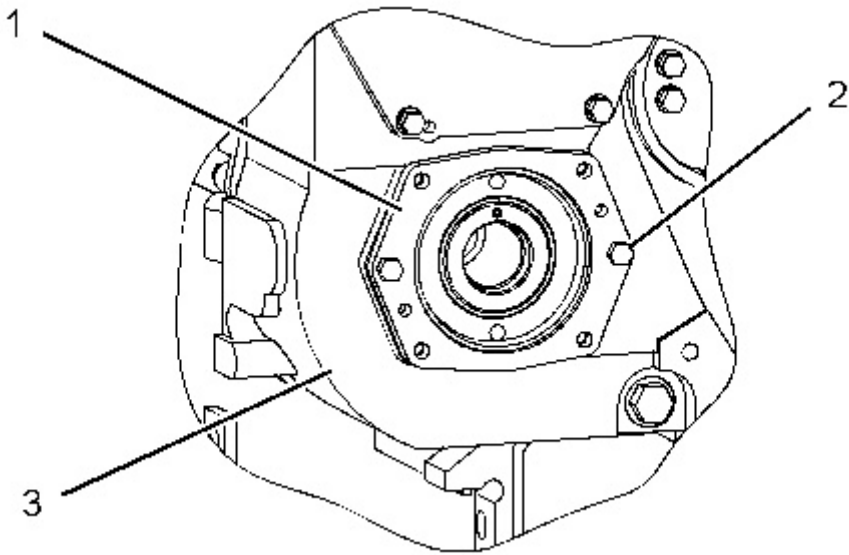


Illustration 1

g01132543

1. Remove bolts (2).
2. Use Tooling (A) to remove pump adapter assembly (1) from front housing (3). Remove the O-ring seal from the pump adapter assembly.

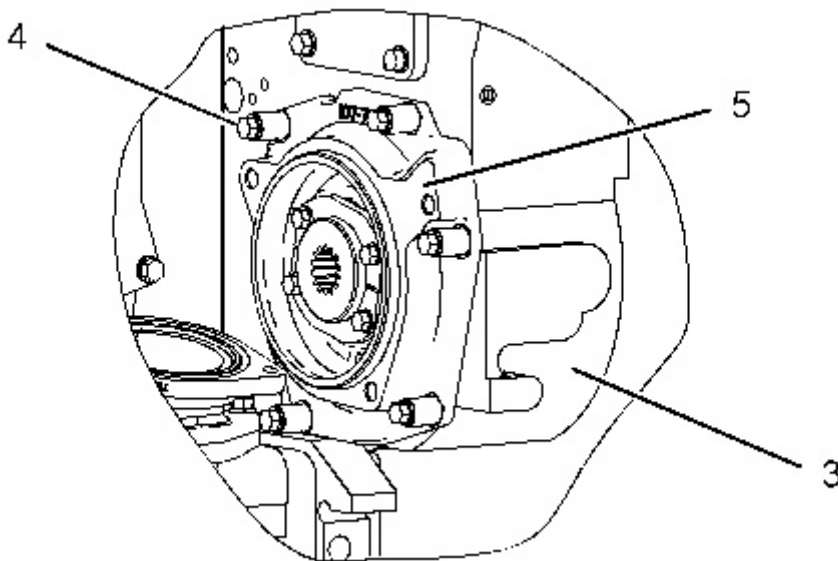


Illustration 2

g01132545

3. Remove bolts (4).
 4. Use Tooling (B) to remove pump adapter assembly (5) from front housing (3). Remove the O-ring seal from the pump adapter assembly.
-

Thank you so much for reading.
Please click the “Buy Now!”
button below to download the
complete manual.



After you pay.

You can download the most
perfect and complete manual in
the world immediately.

Our support email:

ebooklibonline@outlook.com